We claim:

1. A method for protecting components of a primary system of a boiling water reactor having a pressure vessel and a feedwater line opening out into the pressure vessel, the method which comprises:

providing an alcohol that is oxidizable under operating conditions of the primary system;

feeding the alcohol into a primary coolant to establish an alcohol concentration of from 0.1 to 300 µmol/kg in a downcomer, the downcomer extending downward at an opening of the feedwater line, with surfaces of the components still being bright or covered only by a native oxide layer.

2. The method according to claim 1, which comprises setting the alcohol concentration to less than 10 µmol/kg.

3. The method according to claim 1, which comprises protecting the components against stress corrosion cracking.

4. The method according to claim 1, which comprises feeding the alcohol into a condensate or feedwater system and carrying the alcohol into the primary system with the feedwater.

5. The method according to claim 1, wherein the alcohol is selected from the group consisting of methanol, ethanol, and propanol.

6. The method according to claim 1, which comprises doping the component surfaces with a precious metal.

7. The method according to claim 6, wherein the component surfaces are doped with platinum.